**Feature**

# Insect insights

A new book highlights the lessons from nineteenth-century bug collectors. **Nigel Williams** reports.

This year has seen a major celebration of one key Victorian biologist: Charles Darwin in the bicentenary of his birth and 150 years since first publication of the *Origin of Species*. But a new book celebrates many other Victorian biologists, focused on insects, who also made an impact on natural history.

*Bugs and the Victorians*, by John Clark at the University of St Andrews, celebrates the entomologists who unravelled so much natural history with also lessons on how human society might be organised too.

He highlights Darwin's neighbour, John Lubbock, who was a keen entomologist with many other interests and whose book *Ant, Bees and Wasps* ran to 18 editions. Lubbock provided the land to Darwin that became his famous 'sandwalk' at Down House, where Darwin pondered his evolutionary ideas. It is an exploration of the coming of age of entomology in the UK. The collection and curation of insects was nothing more than a curiosity in the early nineteenth century; an amateur pursuit for the appreciation of diversity and beauty in nature and, ultimately, admiration for the creator of these organisms.

But, as society changed rapidly in the nineteenth century, so too did science. Bees and ants became important topics of research, and Clark describes the beehive as being considered 'an analogue of human social organisation'. Improvement of bee-keeping practices led to the creation of hives that avoided destruction of the colony, facilitated maximum productivity and protection of the queen, which inevitably led to analogies with Victorian society. The new hives were also paralleled to agricultural and urban reforms.

Slavery was similarly studied from the observation of Amazon ants stealing the pupae of other species and rearing them for the purpose of labour in the nests of the host species. The ability to draw behavioural comparisons between human and insect societies made insect experimentation and observation more than an idle pastime: there was now a basis for political and social commentary and the engineering of the human masses.

Darwin was drawn into the debate. As a long-term supporter of the anti-slavery movement Clark points out that he was very careful not to naturalise his studies on ants to the human institution of slavery, still a major issue in the southern US.

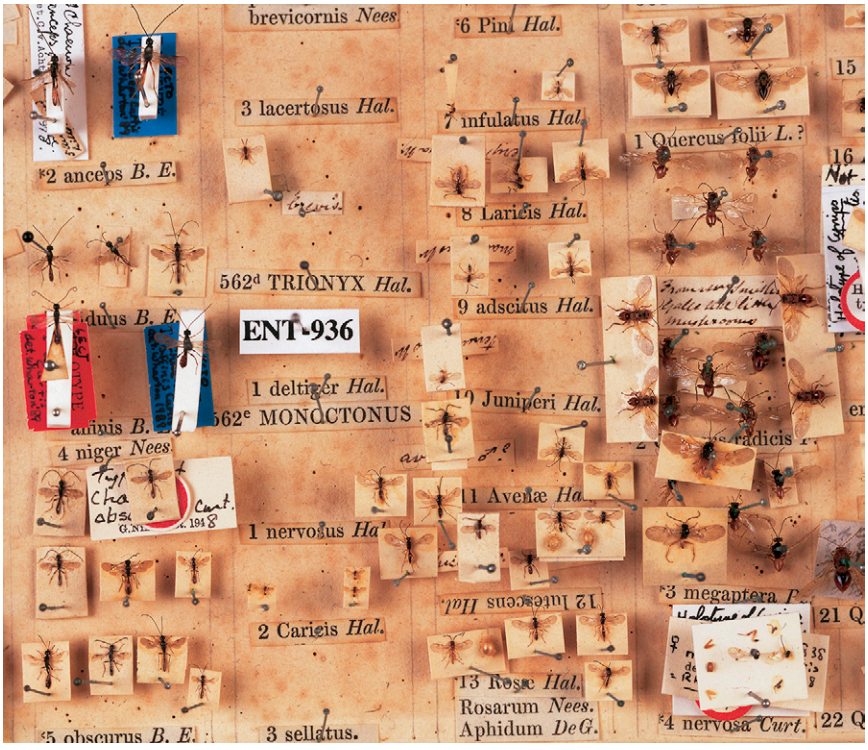
Clark examines the political and ideological issues behind the development of entomology from a curiosity to a science. He charts its progression from the realm of amateurs and scientific naturalists to the establishment of formal entomological education, programmes of experimentation, communication of entomological science to the public, the formation of professional bodies and the ultimate appointment of salaried experts in entomology.

The subject added greatly to the evidence of natural selection. The paper by Henry Walter Bates to the Linnean Society in 1861 was a dramatic confirmation. Bates discovered in South America that edible butterflies had evolved to resemble highly distasteful ones belonging to a different family. "In my opinion it is one of the most remarkable and admirable papers I ever read in my life," enthused Darwin.

Bates recognised the importance of what he had described: "The study of butterflies — creatures selected as the types of aireness and frivolity — instead of being despised, will some day be valued as one of the most important branches of biological science."

The importance of the application of empirical knowledge to real-world problems was a critical stage in this process as the pest and vector capabilities of insects was encountered and expert knowledge was required to overcome them.

Clark describes the problems with flies in the era of horse transport, when tonnes of dung were deposited in cities creating major food source for the insects. The fly grubs were




**Revelation:** Collecting insects revealed many wider biological insights. (Photo: Museum Victoria/Rodney Start.)

'without wings, without legs, without eyes, wallowing well pleased in the midst of a mass of excrement,' as the author Henry Mayhew described.

Flies carried bacterial gastroenteritic diseases and were the cause of significant infant mortality in the late nineteenth century in the absence of good sanitation.

The prospect of invasion by the damaging Colorado potato beetle provided impetus for the development of economic entomology in the UK, and, as political and scientific agendas clashed over the issue, Britain's first official agricultural entomologist's post resulted from this situation. Police stations carried pictures of the beetle in the UK up to the 1960s alongside wanted, suspected criminals. Although the beetle didn't produce the problem in the UK originally feared, it raised the spectre of insect pests.

The book also highlights some early entomological pioneers. The wealthy Eleanor Ormerod applied her interest in the discipline by assisting — without payment — various agricultural bodies, including the Royal Agricultural Society, with her expertise. Her role in introducing the large-scale introduction pesticides to kill insects damaging crops was a critical step in the establishment of the field of economic entomology.

Clark also records the activities of the entomologist Harold Lefoy at Imperial College, London. Lefoy founded Rentokil, the pest control company, and may have been one of the first 'research entrepreneurs'. But on 10th October 1925, he was overcome by fumes while experimenting on a gas of his own invention, and never enjoyed the profits of his company.

The development of medical entomology, too, is explored. It largely evolved from parasitological studies, and early reports in the field generally came from medical doctors who lacked insect knowledge. In 1877, physician Patrick Manson claimed that the filarial worms responsible for elephantiasis were transmitted to humans when drinking water that was infested with mosquito eggs: he had failed to observe the transmission of the parasite during the insect blood meal. Understanding of insects was becoming a serious business.

*Bugs and the Victorians.*
J.F.M. Clark. Yale University Press.
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# Web wonders

David Attenborough, the veteran natural history television presenter, launched last month the BBC's first major step in putting the vast archive of its famed natural history unit online.

The service 'Wildlife Finder' is supported by extensive background information on habitats and species. It is hoped the site will reflect not only the diversity of environments but also the amount of work produced at the BBC's natural history unit in Bristol, which has been making programmes for the channel for more than 50 years.

It includes Attenborough's famous forest encounter with a lyrebird as it mimicked the sound of lumberjack chainsaw gangs and the noise of car alarms. And also his interaction with gorillas in central Africa. "There is more meaning and mutual understanding in exchanging a glance with a gorilla than any other animal I know," he said.

Describing the blue whale, the largest animal on the planet, he said: it is "30 metres long and weighs over 200 tonnes. It's bigger than the biggest dinosaur. Its tongue weighs as much as an elephant, its heart is the size of a car and some of its blood vessels are so wide you could swim down them."

Another famous film is that of a tiger. Attenborough remained silent for much of the sequence when he came face to face with the animal. He interrupted images of the animal hunting only to explain its demise from being one of the planet's top predators to one of its most endangered species.

Fresh clips are being uploaded to the site and by early next year 3,000 clips will be available for viewing, along with audio recordings, and users will be able to search by species or habitat.

George Entwistle, the BBC's controller of knowledge commissioning, describes Wildlife Finder as the BBC's first experiment in putting its archive online. "The web has totally changed how we can link together information, connect people and reach audiences in an on-demand world," Attenborough says. He has selected some of his favourite clips. For him they represent "a snapshot of the incredible diversity of life on earth". And at the human level he includes clips from a programme he made on Easter Island. He tells of a society which descended into warfare and died out as its natural resources dwindled. "Surely we have a responsibility to leave for future generations, a planet that is habitable by all species."

**Nigel Williams**

**Natural histories**: The BBC's new web archive will provide valuable material for those looking at the change in habitats and species. (Photo: John Sparks/naturepl.com)